

THE  
BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. LXII.

THURSDAY, JULY 19, 1860.

No. 25.

THE SPIRAL DIRECTION OF THE VESSELS OF THE UMBILICAL  
CORD IN THE HUMAN FŒTUS.

[Read before the Boston Society for Medical Observation, and communicated for the Boston Medical and Surgical Journal.]

BY WILLIAM READ, M.D., FORMERLY ONE OF THE PHYSICIANS TO THE  
BOSTON LYING-IN HOSPITAL.

In a recent number of the *Edinburgh Medical Journal*,\* the writer proposes a most ingenious and plausible theory to account for the spiral direction of the vessels in the umbilical cord of the human fœtus. After a *resumé* of the anatomical peculiarities of the fœtal circulation, and the opinions held by different writers and investigators upon the subject, he proceeds to state his own theory "that the twist is dependent on the structure and distribution of the arterial system of the fœtus, and the action of the heart upon the fluid within its tubes."

Many explanations have been given by various writers as to the cause of this, but Mr. Simpson alludes to two only as worthy of notice—Velpeau and Schroeder Van Der Kolk: the former of whom attributes it to the rotary motion of the child in the liquor amnii, produced by the movements of its limbs; while the latter, on the contrary, considers that it is due to the greater pressure of the blood in the arteries than in the veins, causing it to turn to one side or the other according as they are placed to the right or left side of the umbilical vein in the umbilical ring. By Velpeau's theory, the direction of the twist is owing entirely to chance. By that of Van Der Kolk, while the force producing the twist is a constant one, and therefore not casual or accidental, the relative position of the vessels with respect to each other at the ring is entirely a matter of chance, and therefore, chance, even under his theory, must, after all, determine it equally as under Velpeau's theory.

\* On the Cause of the Spiral Direction of the Umbilical Vessels, and the Convolutions of the Cord in the Human Fœtus. By John Simpson, Esq., F.R.S.C., L.R.C.P., Surgeon, Royal Naval Hospital, Haslar. *Edin. Med. Journal*, July, 1839, p. 22, et seq.

The evidence upon which Mr. Simpson relies to substantiate his position, is found in the marked difference between the right and left common iliacs, both as to the angle they form with the axis of the aorta, and their unequal capacity. In proof of this, he cites eleven preparations in the museums of the University and the College of Surgeons, Edinburgh, and one made by himself, in all of which the axis of the right iliac coincided more nearly with the axis of the aorta than that of the left, and its capacity was much greater. This anatomical peculiarity corresponds with what is found in the preparations in the Cabinet of the Medical College in this city, and in the specimen before me, taken from a full-grown, stillborn male. (Fig. 1.) In this last the inequality between the two is very great, the left iliac looking like "an insignificant branch," and affording but a slight antagonism to the current flowing through the right. The fact, therefore, of this irregularity, and consequently of the great preponderance of circulating fluid in one of the arteries, is not to be doubted.

FIG. 1.



A. Aorta.  
B. Right common iliac.  
C. Left common iliac.

In three of the specimens cited—Nos. 393, 394, and the one prepared by himself—the twist in the cord was to the left, or in the usual way. In one—No. 395—the spiral twist in the cord was to the right, and the arteries, on issuing from the ring, passed to the left, *below* the umbilical vein, to which arrangement the reversed twist, according to Mr. Simpson, was due. The reason for this result is given (*Edinburgh Medical Journal*, p. 29) in the following words:

"The current of blood in the two common iliac arteries is unequal; the right, independently of its frequently larger calibre, will receive more force and energy from each pulsation of the foetal heart than the left, and this inequality will also be carried into their respective hypogastric branches. When the two hypogastric arteries, having the remains of the urachus between them, converge towards the umbilicus, each will tend to cross above the umbilical vein from its own side. But owing to the manner in which these vessels are surrounded by the sheath of the amnion, they would counterbalance each other; but from the circumstance of their forces being unequal, the result will be that the weaker will give way, and the composition of their forces, instead of forming a line the diagonal of the two, will incline more or less in the direction of the stronger. The consequence of this will be, that the right or stronger current, in ordinary circumstances proceeding in the direction from below upwards on the right side of the umbilical vein, will pass over and round it in the direction of the usual umbilical twist, carrying with it also the left hypogastric artery. The cord being fixed at one end by its attachment to the placenta, cannot yield, by twisting, to the pulsating force conveyed through these arteries; but the foetus, floating freely in a fluid of its own specific gravity, readily gives way to the recoil acting on its pelvis; and from the position of the vessels at the umbilicus, the vein

will represent the pivot on which it will move, while the right artery, having the greatest power of recoil, will determine the direction of the rotary motion which ensues. Thus, supposing the placenta to be attached to the fundus of the uterus, and the foetus floating with its face towards the placenta, then its rotary motion will be by its cephalic and pelvic ends passing in succession, with regard to the uterus, from right to left anteriorly, and from left to right posteriorly."

From this extract it will be seen that the cause assigned for the twist is altogether a mechanical one; its application must therefore be criticised upon mechanical grounds alone.

The first objection to this explanation is, that if there exists this constantly predonderating force on the right side of the pelvis, derived from the greater amount of blood coursing through the right iliac and hypogastric arteries, by every principle of mechanics its recoil would be in a direction opposite to the current of blood—*i. e.*, supposing the foetus to be suspended in the water of the amnios, with its cephalic extremity next the observer, the head would pass from right to left, and the feet from left to right, and therefore when the right common iliac is the largest, the recoil being in the direction just stated, the twist would be from right to left, forming a right hand spiral, or what is called the reversed or unusual twist. And, indeed, with this in mind, it is difficult to perceive how the twist could ever occur in the direction it usually takes. And yet, against all this preponderating influence, the twists to the left outnumber those to the right in the proportion of five to one. Of 54 instances noted, 42 were twisted to the left, 8 to the right, 3 were not twisted at all, and one was twisted in both directions.

The second objection is, that if "from the circumstance of their forces being unequal, the result will be that the weaker will give way, and the composition of their forces, instead of forming a line the diagonal of the two, will incline more or less in the direction of the stronger" (see ante), in every case where the right iliac very much exceeds the left in capacity, and is nearer the axis of the aorta, the arteries ought to cross the umbilical vein *above* it. But in every case where the relative size of these arteries has been ascertained, the right is the largest; while the position of the arteries at the umbilical ring, with one single exception, is exactly the reverse of what Mr. Simpson's theory assumes that it ought to be.

The third objection is, that this explanation of Mr. Simpson will not in any way account for the occurrence of two opposite twists in the same cord, a fact noticed by Dr. Hunter, nor for that species of twist which is found for a few inches nearest the placenta, while all the rest of the cord is without any twist at all. In the specimen on the table may be seen a marked example of two opposite twists in the same cord, with the added complication of a knot between. (Fig. 2.) The direction of the spiral is to the

right from the umbilical end to the knot, and in the opposite direction—to the left—from that point to the placenta. The cord in this instance was twenty-eight inches in length.

I am indebted to Dr. C. E. Buckingham for a curious example of the other form of exceptional twist. In the case communicated by him, the umbilical portion of the cord was entirely free from twist. At the placental portion, for about twelve inches, the spiral formed by the vessels was strongly marked, and turned to the right. The case is also interesting, as it disproves the assertion made by various authors, and particularly Dr. R. Lee (*Lectures on Midwifery*, London, 1844, p. 120) that the "Spiral course of the umbilical arteries round the vein, and twisting of the whole cord, always commences and exists in the highest degree at the umbilicus of the embryo."

Besides the two exceptional twists already alluded to, there are other forms which the vessels of the cord assume, which are equally inexplicable by any theory like that advanced by Mr. Simpson.

FIG. 2.



A. Umbilical end of funis.  
B. Placental portion.

FIG. 3.



A. Umbilical end of funis.

FIG. 4.



A. Umbilical end of funis.

One of these exhibits the vessels running across the cord (Fig. 3) like the threads of the filling in a bit of narrow ribbon, for instance, and in this way taking up three or four inches of its length next the umbilicus, before they start in their spiral course. Another arrangement (Fig. 4) shows the artery forming kinks at short intervals, alternating with the cross-bar arrangement already mentioned, throughout its whole length, with hardly a single turn of the vessels from the umbilicus to the placenta. Instances of both these have occurred under my own observation within a short time.

The length which the cord acquires early in pregnancy—earlier even than the date at which writers say that the twist begins to form—is also an objection to the assumption that the body of the foetus floats so freely in the liquor amnii as to be readily influenced by the recoil of the blood in the vessels of its own system. We



see, in the specimen on the table—an abortion of three and a half months—an instance of this. The length of the cord here is so great as to render it certain that, instead of being suspended in the water of the amnios, whatever may have been the position of the mother, whether erect or reclining, the fœtus must have rested on the walls of the uterus, sinking to its lowest point from the effect of its own weight.

In a specimen of an unruptured ovum of two months, in the possession of Dr. C. G. Putnam, of this city, is to be seen another proof of the validity of this objection. In this preparation the embryo is dimly visible through the semi-transparent walls of the sac, lying on the bottom, whatever way the sac is held, showing that the free, floating condition of the fœtus, assumed by Mr. Simpson, does not always exist.

And, finally, Mr. Simpson has himself furnished the best and most complete refutation of his own theory in the illustration he brings forward to prove it. He says:—

“There are several ways in which might be illustrated the recoil of a force acting as the pulsation of the fetal heart does; and among them is one I may mention, a continental modification of what used to be called in this country a philosophical toy. It consists of a hollow piece of glass made into the shape of a devil or imp, with the usual appendages of horns and a tail. The latter is conveniently coiled round his body out of harm’s way, and being also hollow, forms a communication with the interior of the body of the imp. This is placed in a tall, wide-mouthed glass bottle, filled to the brim with water, and covered over with a membrane having some elasticity; and when pressure with the hand is applied above, the water is forced into the cavity of the imp, which, as the air within it is compressed, descends to the bottom of the bottle. If the pressure of the hand be removed quickly, the sudden expansion of the air within the imp expels the water through the hollow tail, and meeting the resistance of the surrounding fluid, causes a recoil upon the body of the imp, and produces a rotary motion in it in a direction opposed to that of the stream. By alternate pressure and relaxation of the hand, a series of jets can be produced from the tail, simulating the beats of the heart in the fœtus and illustrating its force in causing rotation.”

But in this illustration the recoil is supposed to be produced by the force of the fluid, acting to throw the body of the imp in a direction opposite to its current. And, indeed, it does so. Now applying this principle to the fœtus, the recoil of the body ought to be in a similar direction; *i. e.*, as the blood flows in a circular direction, from the branching of the aorta to the umbilical ring, the recoil ought to be in an opposite direction, and turn the body that way, in a direction exactly opposite to what is assumed in the first part of the paper, in which a left hand twist in the cord is attributed to the greater size of the right branch of the common iliac artery.

Whether, therefore, we take the facts and endeavor to make

his theory agree with them, or, *vice versa*, attempt to reconcile the theory with the data upon which it is based, the result in both cases will be a failure. Not only is it not a general fact that there is any correspondence between the twist and the particular enlargement of the iliaes, but it seems also probable that the position of the two arteries with reference to the umbilical vein as to their passing out of the ring above or below it, is the *result* of the twist rather than *its cause*. No matter what may have been the relative location of the three vessels when they converge to enter the ring from the pelvic side, a single revolution of the body of the fetus from right to left, or the contrary, will bring them into the position they are found at birth.

Indeed, it is to be doubted whether Mr. Simpson's proposition "when the hypogastric arteries, having the remains of the urachus between them, converge towards the umbilicus, each will tend to cross above the umbilical vein from its own side," is sound. Supposing a perfectly free course to the current of blood, and no obstruction presenting either from the surroundings of these vessels, or by any contraction of their calibre, upon what principle of mechanics can it be predicted that they will not pass along side by side, with no twist at all, as we see in the specimen before us—an abortion of three and a half months, an age at least much greater than that at which the twist is assumed to begin, and which is set down as commencing from the tenth to the twelfth week.

---

#### SALIVARY CALCULUS.

By H. B. BURNHAM, M.D., EPPING, N. H.

[Communicated for the Boston Medical and Surgical Journal.]

J. H., aged 48 years, of spare habit and slender constitution, some fourteen years since was seized with a severe pain under the left side of his tongue. He applied to his family physician, who could give him no satisfactory information as to the cause or nature of his complaint; neither could he afford him any relief. He was induced to consult other physicians in his vicinity, and he did so with like results. In the mean time, a small tumor made its appearance on the under side of his tongue, near or at the seat of pain. He went to Boston and consulted the late Dr. —, who informed him that his disease was cancer, and gave him but little encouragement as to any permanent relief. He returned to his home, determined to abide the result of what he then supposed an incurable disease. From that time until about the first of February last, he has suffered paroxysms of severe and excruciating pain at different times. The tumor gradually increased in size, and the paroxysms of pain became more frequent, until it finally became inflamed, suppurated and burst, discharging a small quantity of pus and a calculus weighing fifteen grains, having the

general appearances of ordinary renal or biliary calculi. He has since been entirely free from pain.

---

NOTES UPON THE CAUSES OF THE DISTINCTION BETWEEN  
BRONCHITIS AND PNEUMONIA.

[Read before the Société de Biologie, Aug. 21st, 1858. By Dr. CHARLES ROBIN. (*Mém., Vol. V., 2d Series, pp. 93 et seq.*) Translated for the Boston Med. and Surg. Journal by Dr. C. F. CREBORE.]

DURING the ten years that I have taught the substance of the following remarks, I have vainly sought in the greater part of our classical and special treatises the necessary data to solve the question about to occupy me. A simple inspection of these works explains the cause of the deficiency—for it is easy to perceive that their authors have studied the results of the alterations occurring in the tissues without possessing any exact idea of the character and reciprocal relations of the elements normally composing those tissues. In the case of the lung, for example, they sum up its general structural characteristics by saying, that, when once the bronchi enter the substance of the lung, they rapidly lose their firmness in consequence of the disappearance of the cartilaginous rings, and, becoming at length entirely membranous, are lost in the pulmonary cells or vesicles, hence often called "bronchial terminations." They further assert that a mucous membrane, constituting the essential portion of the respiratory organs, is continued in a uniform layer from the larynx to the extremities of the bronchi, and that this layer, somewhat thinned, exists alone in the pulmonary vesicle. According to some, the vesicles are separated from each other by the interposed cellular tissue—according to others they are in contact, and the dividing wall is homogeneous in its structure.

While, relying upon these statements, I considered the phenomena from this point of view, I was astonished not to see bronchitis invariably pass into pneumonia—especially that form of bronchitis known as capillary, in which symptoms of asphyxia are superadded to those of intensely acute bronchitis. (The asphyxia is caused by a change in the secretion of the bronchi, which becomes muco-purulent and very viscid.) Yet nothing can be more distinct than the pathological lesions, or the symptoms that characterize these two affections. It may be said that the general state of the patient, the nature of the cough, the signs derived from auscultation and percussion, and the character of the expectoration in the two diseases, have no resemblance. No two things can be more distinct than they, and nothing more certain than that they oftener appear simultaneously under the influence of a common cause, than that one passes into the other, either by the extension of the inflammation of the bronchi to the lung—or by propagation from the lungs to the bronchi.

The marked difference between them is, in fact, incomprehensible, and, in some sort, mysterious, when we consider the whole respiratory tract as lined with a continuous membrane from the larynx to the air vesicles or bronchial extremities.

But it is important to know that the anatomists, as well as the practitioners, have allowed themselves to be misled in this case by the too evident continuity of the canal of the bronchus with the cavity of the air-cell opening into it. This is not less erroneous than it would be to assert that the uriniferous tubules were continuations of the urethra, bladder, or ureters, which, as they arrived at the kidney, ramified into the tubules—their mucous membrane, thinned, alone persisting in these conduits. To admit such an hypothesis in regard to the bronchi without direct and careful observation of the tissue which limits them, is to commit an error analogous to that which considered the capillaries to have the same structure as the arteries and veins, on account of the continuity of their canals.

To settle this point, I shall re-state the following facts, which I have already, at different times, given to the public.

After a certain amount of subdivision, the bronchi (one and sometimes two millimetres— $\frac{3}{10}$ ,  $\frac{6}{10}$  inches—in diameter) have no longer the partial cartilaginous rings; they also cease to have transverse muscular fibres, elastic longitudinal fibres and a mucous membrane separable from the proper bronchial wall. They also lose their ciliated epithelial coat—in a word, they lose the characters of bronchi. These pulmonary canaliculi, which are continuous with the real, unmodified bronchi, and are wrongly termed ultimate bronchial ramifications, are further subdivided and terminate in rounded culs de sac, slightly enlarged at their base, and improperly called the bronchial or pulmonary *cells*. (At birth these measure 0.08 mm., and in the adult .1 mm.—.2 mm. in diameter.)

These canaliculi have nothing of the bronchial structure, but one of their own, characteristic of the pulmonary parenchyma. Their walls are composed of closely interwoven bundles of fibres of elastic tissue—of a laminated tissue of fibro-plastic elements, and of vessels. These last form on the internal face of the conduits (which present slight salient folds) a network different from that of the capillaries, ramifying upon the bronchi proper. This network is composed of large capillary vessels, so closely interwoven as to leave the free interspaces of less diameter than their own.

It is distributed over the tissue of the walls of the pulmonary conduits, although there is no mucous membrane separable from the elastic coat, and there is nothing between it and the cavity of the tubes but a layer of pavement epithelium with large nuclei, that commences at the points where the cylindrical or ciliated epithelium of the bronchi ceases.

Thus the pulmonary conduits, where hæmatisis is effected, have

a different structure from the bronchial tubes which bring the air to them. It is impossible to find in them a mucous membrane distinct and separable from the elastic parenchyma and laminated tissue in or upon which is distributed a capillary network—such as is seen in the bronchial tubes provided with cartilages, where there is a mucous membrane separable by dissection. This fact affords an easy explanation of the facility of absorption in the lung compared with that in other organs provided with a mucous membrane, and also of the easy rupture of the capillaries and escape of blood (or an injection) into the air-passages.

Thus there is as much difference in anatomical structure between the bronchus and lung as there is between the tissue of a secreting gland and its excretory duct, and the inference is unavoidable that diseases pertaining to one or the other of such distinct tissues should themselves be distinct.

But there is yet another important cause to account for the infrequency of the extension of bronchitis into pneumonia. In bronchitis that portion of the capillary system which is the seat of inflammation, belongs to the general or systemic circulation, and is supplied with red or arterial blood.

In pneumonia, on the contrary, the capillaries of the lesser circulation, in which the dark blood from the pulmonary arteries is aerated and which nourish the parenchyma of the lobules, are the seat of inflammatory action. It is at the expense of the dark blood that the morbid products of pneumonia are formed—as in hepatitis it is the blood of the portal circulation that furnishes materials for suppuration of the liver.

It is well known that the pulmonary arteries, although accompanying the bronchi in all their ramifications, give off no branches to them, nor to the interlobular spaces, and that they do not anastomose with the bronchial arteries. These last are not distributed beyond the point where the nuclei of the cartilages disappear (where the canal has a diameter of about a millimetre), and it is precisely at this point that the branches of the pulmonary arteries break up into capillaries between the contiguous walls of the pulmonary canaliculi, thence to ramify upon their internal surface beneath the layer of pavement epithelium, in a vascular net work of peculiar character—the type of which is preserved in the lesser circulation of all the vertebrates, as far as the fishes.

The bronchial arteries, on the contrary, beyond the bronchi, give off no branches except the vasa vasorum and those distributed to the interlobular laminated tissue, continuous with the pleura.

The preceding particulars of the organization of the lung, as compared with other organs, are of the first importance for the solution of the question to which this paper is devoted; but they equally well explain the causes which distinguish inflammation of the lung, in its nature and progress, from inflammation of other

organs, and also the modifications produced in pneumonia by the age of the patient—modifications more marked than any which occur in a single disease in other organs, and this, not only because, according to the age, the respiratory canaliculi offer marked differences of structure, but especially because inflammation is controlled in its nature and course by modifications of the circulation, and these are nowhere so striking as in the lesser circulation, which anatomically and physiologically unites the two hearts.

Besides differing in arrangement from the bronchial and other systemic capillaries, those of the lung have also a structural difference from them. They are in fact the largest in the economy, and the nuclei in their walls are smaller, more numerous and nearer together than in those of the systemic circulation. It is important to observe that the capillaries of the liver present the same peculiarities.

These facts are not without value, when it is remembered that inflammation is a morbid state of capillary circulation. Inflammation is, in fact, a complex phenomenon, but it principally affects the function of circulation, being especially a modification of it in the capillaries of the part or whole of one or more organs—or rather, it is a succession of phenomena occurring in the capillaries, and characterized by, first, a contraction of the minute arteries and veins of the part—the proper capillaries as yet taking a scarcely apparent, though real part in the phenomena; and, second, a repletion and dilatation of the true capillaries, with a slackening and oscillation of the circulation—characteristic of simple congestion. In some cases, this state of things may be followed by complete stasis, with great engorgement and distension of the capillaries, gradually extending to the minute arteries and veins. The capillaries in which the veins originate, ceasing to furnish them with blood, the current slackens and finally stops, and the veins are only supplied from the collateral circulation, and with a constantly decreasing force, so that the blood globules, not carried on as in the normal state, gradually accumulate. This is the cause of the sort of passive congestion and swelling, which extends in the inflamed organs beyond the portion of its capillary system, which is the seat of the essential phenomena of inflammation, i. e., beyond the portion of the organ that is really inflamed.

The study of inflammation demands a profound knowledge of the capillary system—as much in regard to the intimate structure of the vessels, as in regard to the disposition of their ramifications. And as these ramifications or meshes (*"réseaux"*) differ in the different tissues, being subordinate to the arrangement of the fundamental elements of the tissues, there result several important physiological peculiarities—among them the fact that inflammation, offering everywhere general or common phenomena, presents different peculiarities according to the tissue in which it occurs. To properly appreciate these differences necessitates the

study of the capillary structure of the organs. The process is not only not always identical, but the products—as pus—differ notably in the various tissues. Moreover, the difference of these products is much affected by the influence of the nutrition of the fundamental, anatomical elements upon the blastema, exuded during inflammation.

To the peculiarities offered by tissue, to which the systemic circulation is distributed, these must be added, in the case of the lung—the presence of a capillary system, receiving dark or venous blood, and belonging to a distinct circulation.

These remarks also apply in great part to the liver, inflammation of which presents many points of resemblance to the same trouble in the lung.

---

#### DOMESTIC ARSENICAL POISONING.

THE Legislature has done its best to hinder poisoners from procuring or administering arsenic without arousing suspicion. The returns of the Registrar-General seem to show that the effect has been to change the character of crimes and suicides by inducing a resort to other poisons rather than to diminish their frequency. It must be said, too, that our manufacturers and tradesmen do their best to nullify the benevolent intentions of the Legislature, in protecting us from the criminal administration of arsenic, by substituting slow and ingenious processes of domestic poisoning, and introducing such a quantity of arsenic into articles of home use as may readily supply the fatal dose. The recorded cases of arsenical poisoning from the emanations of green paper-hangings are now sufficiently numerous to call for a strong expression of public opinion, and a general admonition as to the danger of such Borgian decorations. No process of poisoning can be more subtle, more gradual, or in time more certainly mortal, than that to which they give rise. Only acute and trained observation, guided by a concurrence of symptoms and circumstances, led to the first suspicion of their toxic influence by Dr. Halley, himself a sufferer. This observation, once made, has since been repeated with unpleasant frequency.

We recorded last week the most recent instance: it occurred under the observation of Dr. Ballenden, of Manchester. Three children were introduced into a sleeping chamber, newly papered with green hangings. Soon they pined unaccountably; they became emaciated; they grew restless and nervous; then occurred involuntary twitchings of the muscles of the face; and then, Dr. Ballenden's intelligence led him to look for the external cause of a series of symptoms otherwise inexplicable, and the children were removed in time from the arsenical atmosphere which they had been breathing. These symptoms, together with more or less



of smarting in the eyelids, ophthalmia, and subsequent gastro-enteric affections, have marked all the recorded cases. They are such as might be expected to result from arsenical poisoning. It is not altogether tranquillizing to reflect upon the consequences which may have followed the use of these hangings in times past, when the bed-room walls were not suspected of poison, and when children and grown people were not "removed in time." It is certain that papers thus tinted have long been used, and that the observation of their dangerous effects dates not a score of months back. The narrowest scope of governmental duty is to provide for the "security of the subject." It may be, then, that here is some ground for interference.

A man may really now-a-days be surrounded with arsenical preparations unawares. There he sits, unconscious in his library, on a summer day, his walls coated with arsenic, a suspicious green dust on his books, and arsenical particles floating in the air, filling his air-passages, inflaming his eyes, disturbing his digestion, and preparing him for dismal and racking pains. He lights a green taper to seal a letter, and as he blows it out he perceives a strong odor, as of onions. The peculiar alliaceous odor is characteristic of arsenic. This Mr. Barnes will explain for him, by the statement that the green color, in every taper which he examined, was produced by the ubiquitous arsenite of copper. Scheele's green, arsenite of copper, begins to be one of the nightmares of our existence. This deadly poison, arsenic, possesses the fatal gift of beauty in its combinations. So it happens that in one form or another it haunts us in our walls, in our paper and paints; it fills the air, and at times gets into our food, poisons our bread, or mayhap, as orpiment, adds a fatal charm to our "Bath buns." A parcel of sweetmeats has this week been forwarded to us by Dr. Bramwell, of Nottingham, which has produced all the symptoms of irritant poisoning in a family of children there. These insidious "lumps of delight" are colored beautifully green in the centre with arsenite of copper, and have a bright-yellow rind pregnant with chromate of lead. Green is the color which we have especially associated with the innocent beauties of nature, and have most delighted to reproduce in our surroundings. In time we shall be stripped of this illusion also. Nothing is innocent now in this world. We must give up these notions worthy of Utopia, and belonging only to Paradise. We must learn to see Scheele's arsenite in all the virid decorations of our rooms, as Adam was fated to see the serpent hidden beneath the leafy cover of the tree of knowledge.

But color is no safeguard. For on the table of this unhappy man—arsenic haunted—lies a brown fly-paper, perhaps a *papier moure*. The spectacle of the sacrifice of a hecatomb of flies is particularly attractive to a child standing near; and as the fly-paper is very pleasantly flavored with a sweet-and-bitter essence, child nature will be sorely tempted to suck the said paper. Let



parents and guardians be warned that each of these fly papers contains an average of 5.3 grains of arsenious acid. Now this is a quantity which is amply sufficient to poison a whole family. It was thought at first that the toxicological list had been, as it were, ransacked for the purpose of completing these poison-traps, and that for the bitter flavor they were indebted to strychnine; but Dr. Brett reports that they are apparently flavored, or rather baited, with quassine and sugar. The sale of these fly-papers amounts, in one sense, to nothing else than the unrestricted sale of arsenic, which the Legislature have sought to forbid. Very little ingenuity is needed to remove the arsenic from the papers; and although we are not disposed to detail the means, yet it were dangerous affectation to speak with baited breath of this source of possible danger.

On the other hand, there are some alleged sources of the unperceived ingestion of arsenic which we believe to have been suggested inaccurately, or without sufficient general grounds. Thus it was said that trisnitrate of bismuth, so much used externally as pearl-powder (*blanc de Venus*), and internally in intestinal and dyspeptic affections, is frequently admixed with a deleterious proportion of arsenic. There is great reason to mistrust such statements. Dr. Edwards, of Liverpool, observes that if the trisnitrate of bismuth be manufactured from the crystalline nitrate there would never be any danger from an artificial admixture of bismuth. He does not believe that arsenic exists in the salts of bismuth to nearly the extent stated, as he has made careful analysis of several specimens, and not found a trace of arsenic. Reports of an exaggerated nature have also been circulated to the effect that arsenic has been found in various salts and tissues, and that the arsenious acid had been absorbed by plants, and subsequently incorporated with the tissues of animals which have fed upon them. All this is mythical. The supposed origin of the arsenic is the sulphuric acid now largely used in the preparation of bones for manure. These are scientific *canards*, of which we would desire to arrest the circulation. But the public and the profession cannot be too much on their guard against those sources of arsenical emanation which experience and judgment have shown to be fraught with danger.—*London Lancet*.

---

---

TRANSPLANTATION OF THE DURA MATER AS A MEANS OF  
DETERMINING ITS PERIOSTEAL CHARACTER.

By M. OLLIER.

THIS paper forms a kind of complement to those we have already noticed as having been read to the Academy of Sciences upon the transplantation of periosteum. While some experimental results, M. Ollier observes, have led a certain number of physiologists to

regard the dura mater as a periosteum, clinical observations have not induced surgeons to place much confidence in this membrane for the reparation of osseous parts, which have been removed, whether accidentally or by the trepan. His experimental resections of the cranium have led the author to believe, with several observers, that there are three sources of reparation to the osseous substance—the dura mater, the diploe, and the pericranium. But in consequence of the various difficulties produced by the conformation of the region and the proximity of the encephalic organs, this mode of procedure has not furnished results precise enough to supply a clear and definitive solution. He, therefore, has had recourse to the mode of experimenting which had furnished so peremptory a proof in favor of the theory of the formation of bone by the periosteum, viz., the transplantation of the dura mater to various regions of the body of an animal of the same species. Strips of this membrane, grafted under the skin, in various regions, have given rise to perfectly-constituted bone, possessed of all the anatomical characters of normal osseous substance; and by virtue of this fact we are authorized in regarding the dura mater, not only as a protective envelope for the brain, but as contributing directly to the ossification of the cranium. This property of the dura mater does not continue in the same degree in all ages, diminishing rapidly in proportion as growth is accomplished. Very well-marked at the commencement of life, it has become much less apparent by the time the skeleton has reached its complete development, and is exhibited in a still less degree when adult age is reached. When transplantation of a fragment of the dura mater is accomplished in the adult rabbit, only numerous and independent osseous granulations are produced on its surface. This influence of age explains to us why the facts observed in a man appear so often contradictory, and why surgeons usually only obtain incomplete reparation after trephining. All portions of the dura mater do not possess the property in a like degree, it being only the external surface of the membrane that does so—the fibrous folds not in contact with bone not being susceptible of ossification on transplantation. The greater proportion of these fibrous tissues at the base of the cranium, added to the difficulty of detaching the dura mater there without tearing it, explains why we obtain, in general, a more abundant ossification with strips taken from the convexity, than with the fragments of the same size detached from the bone.—*Comptes Rendus*, Tome xlix., p. 206.

### Bibliographical Notices.

*Rational Medicine: its Position and Prospects. An Oration delivered before the Members of the Hunterian Society, on the 15th February, 1860.* By STEPHEN H. WARD, M.D., Lond., M.R.C.P., &c. London: John Churchill. 1860.

*Currents and Counter-Currents in Medical Science. An Address delivered before the Massachusetts Medical Society, at the Annual Meeting, May 30, 1860.* By OLIVER WENDELL HOLMES, M.D. Boston: Ticknor & Fields. 1860.

THE little work of Sir John Forbes, Dr. Bennet's Clinical Medicine, and this oration by Dr. Ward, are evidences of the existence of habits of thought and practice among some members of the profession in England, which have as yet found scarcely any utterance in systematic works, and are but faintly reflected even by the periodical press.

"Rational medicine," says Dr. Ward, "is that which has its foundations laid in a recognition of Nature's resources in disease as well as in health; which feels that its object is science, not mystery; \* \* \* \* \* which holds hypotheses upon uncertain tenure, ready to relinquish them as fresh compelling facts flow in; and which, eminently eclectic, avails itself of what is good in all systems, and yet is slave to none." In speaking of the modern advance of the science of medicine, he considers at some length the advantages which have been derived from new means and instruments of investigation, and fully recognizes the aid afforded by the microscope, the stethoscope, and chemical research. But he warningly adds, "the very instruments, by which advancement has been mainly effected, contain within themselves the elements of abuse. We are too ready, our younger and less experienced brethren especially, to exchange the old and tried for the more fascinating new lamps, to be [more] attracted by that which is tangible, which speaks directly and speciously to the mind, and through the exercise of the special faculties of sight, hearing, and touch, conveys the present sense of power, than by the larger contemplation of complex phenomena, and the postponed conclusions it entails." He might have added that some of the most important discoveries of late years have been made, without the aid of these special agents, by men who patiently observed and collated the larger phenomena of the bedside and the dissecting-table. The facts and appearances, which led to the recognition of "Bright's disease" and of "Addison's disease," might have been observed by the physicians of the last century as well as by those of to-day.

The most interesting part of the address is that which relates to the powers of medicine in dealing with disease. Quoting Lord Bacon's damaging remark that the science of medicine has always moved in a circle, he adds: "To the science of medicine this observation has long ceased to be applicable, but as respects the art, the labor has truly ever been in a circle, the alternating links of which have been disease and drugs. From time immemorial, the professors of the healing art, with one or two exceptions, seem to have known nothing of the course and termination of diseases, save in connection with, and as modified by, special therapeutical agents. Nearly all their reasonings upon the action of medicines have, in consequence, been

relative, based upon comparison of one method of treatment with another; they seem never to have thought of taking as the basis of their reasoning, the curative resources of Nature herself, as ascertained by study of the natural course of disease." "A conviction of the large powers of Nature, and the comparatively limited powers of art, in the cure of diseases, is, I am satisfied, daily gaining ground." The uncertainty of our art, and also the whole system of polypharmacy, are traced to ignorance of the natural history of disease. Opportunities for continued and recorded observations of the natural course of diseases are found in our hospitals, and the profession has a claim to look for them at the hands of gentlemen connected with such institutions.

In justification of these views, a brief summary is given of the results from treating several diseases at the Dreadnought Hospital without any special medication. Cases of typhoid fever, which were allowed to run a course uninfluenced by drugs, did better than those in which it had been thought necessary to restrain diarrhoea in the early stages, to relieve constipation (which he regards as to some extent the rule) during convalescence, or to resort to stimulants from the beginning of the attack. Many cases of severe chronic or subacute dysentery have shown that the unaided powers of the system are frequently equal to the repair of the most formidable dysenteric lesions under favorable conditions as regards rest, temperature and diet. The last seven cases of acute sthenic pneumonia which had come under his care had done perfectly well, though no drug whatever was administered, and neither leeching nor counter-irritation were employed.

It is not to be inferred that Dr. Ward has no faith whatever in medicine. He mentions particularly his failure in attempting to treat ague without quinine. Though he regards the action of mercury as prejudicial in many of the diseases for which it is usually given, such as pericarditis, peritonitis, &c., and though Dr. H. W. Williams has shown that it is not necessary to the successful treatment even of iritis, he considers its cautious and protracted administration of great service in many forms of disease, and speaks particularly of cases of dysentery which "have gone on uninfluenced, alike under no special treatment, as under the usual astringent remedies, but in which healthy curative action succeeded" to such administration of mercury. "The action of iodide of potassium in tertiary syphilis appears not less certain; nor is that of iron in anæmia, or of cod-liver oil in strumous affections." "There can be no doubt of the great temporary relief given by certain drugs in various forms of dropsy, \* \* \* nor that there are many cases which modified hygienic arrangements will not meet, without the rational co-operation of special medicine."

He denies that the statement of such views indicates an indifference to the importance of the art of medicine, or in any way lends support to quackery; but we have no space for further quotation, and can only commend the oration to the attention of those of our readers into whose hands it may come. Exaggeration of statement is so apt to characterize the professors of a new faith, that we have been especially pleased with this address, because of its freedom from this fault.

That opinions similar to those here advanced are becoming prevalent in England, we have Dr. Ward's direct testimony, and the time may arrive when such works as we mentioned above will be spoken of as causes of a change in medical practice. They are, perhaps, more properly the indicators of such a change; the exponents of views which

have been for some time forming in the minds of the more thoughtful and philosophical of the profession; it is one medical practitioner saying to the whole profession what many of the profession have been for some time saying to themselves.

Dr. Holmes's Address before our State Society is another production of the school of "rational medicine," and may certainly claim the merit of fearlessness in its avowal of opinion. That such a work would contain much originality and depth of thought, arrayed in a most attractive garb, was to be expected from the reputation of the writer, and the expectation has not been disappointed. Every page sparkles with epigrammatic brilliancy. As the address is already in the hands of many of our readers, no abstract is needed here. We have been especially struck with the passages in which are pointed out "the coincidences between certain great political and intellectual periods and the appearance of illustrious medical reformers and teachers"; with that in which are depicted the prevailing "tendencies of the American medical mind"; and that in which the "fallacy of the universal-degeneration theory, as applied to American life," is incidentally pointed out.

These, however, are apart from the main purpose of the address, which is a consideration of the comparative powers of Nature and of art in shaping the course and affecting the termination of disease. Dr. Holmes advocates reliance upon the natural powers of the system, and his remarks will, without doubt, draw fresh attention to this important question.

It is difficult to discriminate accurately, in the address, between the opinions themselves and the brilliant intellectual effort with which they were advanced. Though we concur in much of what the writer says, we cannot follow him to the extremity of some of his views. It seems not unlikely that he has, as he himself almost allows, "strained the truth a hair's breadth," though hardly probable that *he* has been compelled to this "for the sake of an epigram or an antithesis."

The proposed submersion of the larger portion of the *materia medica*, while it leaves us (through the modern convenience of classing some of its indispensable articles as food) in possession of the necessary and reliable part, would deprive us of some agents of much benefit in the treatment of disease, even though they be not really necessary for its cure.

We question if Dr. Holmes has graver doubts of the efficacy of medication than the majority of his brethren (we speak more especially of the profession in this city), but one would gather from his address that there was no longer any doubt whatever in the matter. May it not be said in this, as in most controverted medical questions, that the truth is not yet sufficiently evident to admit of unreserved statement? The cause is still *sub judice*. Many men are toiling patiently and conscientiously, day by day, in the hope of working out some partial solution. We make room for one extract: "\*\*\*\*\*after all which has been said, the community is still overdosed. The best proof of it is, that no families take so little medicine as those of doctors, except those of apothecaries, and that old practitioners are more sparing of active medicine than younger ones. The conclusion from these facts is one which the least promising of Dr. Howe's pupils in the mental department could hardly help drawing." We submit that the orator has unconsciously offered to his audience of active practition-

ers, who are the agents in this overdosing, the painful alternative of admitting that their daily practice is directly opposed to the dictates of their judgments and consciences, or of classing themselves below the most defective minds of an idiot school.

Any questionable points at which we have hinted should not blind us to the great merit of the address: its admirable analysis and philosophical discussion of the uncertainty of the art of medicine. The question is probed to the bottom; the errors into which we fall are pointed out, and the causes of our uncertainty are brought vividly into light. We hope it will be widely read both by the profession and the general public.

The general similarity of the views advocated in these addresses, delivered at nearly the same time on the two sides of the Atlantic, is our reason for commenting upon them together, and their importance must be our excuse for the length to which this notice has extended.

R. W.

## THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, JULY 19, 1860.

THE subject embraced in our leading article to-day, has not so much practical bearing as many others in the department to which it belongs. It is interesting, however, from the fact that it attempts to refute one of those statements, of which there are so many, founded upon loose observation, and incorporated in medical literature before sufficient time has been allowed to verify or disprove them.

FISKE FUND.—It gives us great pleasure to publish the success of Drs. MORLAND and SLADE in connection with the Fiske Fund Prize, the announcement of which will be found below. As they have already been several times successful at home, where the competition is limited to a narrow circle, it is most gratifying to see the same result in a contest which is open to the world.

At the Annual Meeting of the Rhode Island Medical Society, at Newport, July 11, 1860, the Trustees of the Fiske Fund announced that two premiums of \$100 each had been awarded—one to a dissertation on Diphtheria, by Dr. DANIEL D. SLADE, of Boston, Mass., and one to a dissertation on Uræmia and its Morbid Effects, by Dr. WILLIAM W. MORLAND, of Boston. Other essays of unusual merit had been received by the Trustees. One on the first subject, bearing the motto:—

*"Pallida Mors æquo pulsat pede  
Pauperum tabernas,  
Regumque turres,"*

was particularly noticed as entitled to honorable mention and worthy of publication. One on the second subject, with the motto, "*Il est toujours téméraire d'attaquer des expériences par des raisonnemens,*" was also mentioned as containing the records of original experiments which would be interesting to the profession.

The following subjects were announced for 1861:—

1. Aneurism : its varieties and their appropriate treatment.
2. Ozone : its relations to health and disease.

For the best dissertation on either subject, the Trustees offer a premium of one hundred dollars. Dissertations should be sent, free of expense, to Dr. S. A. Arnold, Secretary of the Fiske Fund Trustees, Providence, R. I., on or before May 1, 1861. Each should be marked by some motto, and accompanied by a sealed packet containing the same motto on the outside, and the writer's name and residence within. Packets accompanying unsuccessful dissertations will be destroyed unopened. The award will be announced at the Annual Meeting of the Rhode Island Medical Society, to be held in June, 1861.

---

RHODE ISLAND MEDICAL SOCIETY.—At the Annual Meeting of this Society, lately held at Newport, the following officers were chosen :—*President*, Dr. Charles W. Parsons, Providence. *1st Vice President*, Dr. Henry E. Turner, Newport. *2d Vice President*, Dr. Jarvis J. Smith, Chepachet. *Recording Secretary*, Dr. Edward A. Crane, Providence. *Corresponding Secretary*, Dr. Geo. P. Baker, Providence. *Treasurer*, Dr. Geo. L. Catlin, Providence. *Censors*, Drs. David King, Newport ; Otis Bullock, Warren ; Geo. L. Collins, Providence ; J. H. Eldridge, East Greenwich ; Wm. G. Shaw, Wickford ; Sylvanus Clapp, Pawtucket ; J. W. C. Ely, Providence ; Chas. H. Fisher, Scituate. *Orator for next Annual Meeting*, Dr. Edward A. Crane, Providence ; *Substitute*, Dr. Edwin M. Snow, Providence.

---

THE VACCINATION OF INDIANS.—We learn from the *National Intelligencer* that one of the Senate's amendments to the Indian Appropriation bill provides, to a limited extent, for the continuation of vaccination among the Indians, recently suspended in consequence of the appropriation having run out. This horrible disease has carried off thousands of the "red men of the forest." By reference to the reports of the office of Indian Affairs for the year 1837-8, we learn that the smallpox swept away whole tribes of these unfortunate people, and that of the Sioux alone 17,200 died of the disease. More recently, in the year 1853, nearly 12,000 of the confederated bands of the Sioux and Omahas died with the same terrible malady. In 1857, four hundred of the Pawnees died from its effects.

---

THE Board of Medical Officers will assemble at Baltimore on the 20th of September, for the examination of assistant surgeons for promotion, or of such candidates for appointment for the medical staff of the Army as may be invited to present themselves. There are now three vacancies in the grade of Assistant Surgeons.

---

CATARACT IN DIABETES.—It would appear from an article by M. Graefe, in the *Deutsche Klinik*, that this surgeon thinks diabetes very frequently the cause of cataract. He examined very carefully, during a journey, a great number of diabetic patients under treatment at different hospitals, and noticed that about one fourth of these patients were affected with cataract. This proportion, M. Graefe states, has also been noted by a great many physicians who have had diabetic patients under their care. It has likewise been observed that both young and



old subjects, laboring under diabetes, suffer from cataract, so that the supposition of mere coincidence cannot be entertained. With the young, the soft cataract has been mostly noticed. M. Graefe extracted three times by the linear incision, with favorable results.

**CUTANEOUS ERUPTIONS FOLLOWING THE USE OF IODINE.**—Dr. Fischer, of Vienna, has published, in the *Med. Wochenschrift*, an able paper, wherein he shows that the continued use of iodine may give rise to eruptions, which assume different forms. He has, in the numerous cases which have presented these eruptions, noticed the four following forms:—1st, the erythematous; 2dly, the papular; 3dly, the nodulo-pustular; and 4thly, the eczematous. The author does not venture to account for these peculiar effects of the alkaline salts of iodine, nor has he come to a fixed opinion as to the doses which may produce them. It is, however, important that the facts should be given proper publicity, as iodine eruptions might be attributed to other causes.

Dr. S. D. Gross has been elected President of the Philadelphia Hospital.—Dr. Daniel Ayres, one of the Surgeons of the Long Island College Hospital of Brooklyn, has been elected corresponding member of the Obstetrical Society of Berlin.—A second medical school has been chartered in Brooklyn, N. Y.—Diphtheria is prevailing in Homer, Cortland Co., N. Y.

#### VITAL STATISTICS OF BOSTON.

FOR THE WEEK ENDING SATURDAY, JULY 14th, 1860.

##### DEATHS.

	Males.	Females.	Total.
Deaths during the week, . . . . .	42	31	73
Average Mortality of the corresponding weeks of the ten years, 1850-1860, . . . . .	36.3	32.6	68.9
Average corrected to increased population, . . . . .	..	..	78.6
Deaths of persons above 90, . . . . .	..	..	..

##### Mortality from Prevailing Diseases.

Phthisis.	Chol. Infantum.	Scarlet fever.	Pneumonia.	Dysent.	Smallpox.	Dysentery.
11	6	4	2	3	1	2

##### METEOROLOGY.

From Observations taken at the Cambridge Observatory.

Mean height of Barometer, . . . . .	29.936	Highest point of Thermometer, . . . . .	82°
Highest point of Barometer, . . . . .	30.132	Lowest point of Thermometer, . . . . .	50°
Lowest point of Barometer, . . . . .	29.728	General direction of Wind, . . . . .	Westerly.
Mean Temperature, . . . . .	65° S	Whole amt of Rain in the week . . . . .	1.615 in.

**TO CORRESPONDENTS.**—We find it necessary again to remind correspondents that anonymous communications are not only considered inadmissible, but will be at once destroyed.

We have been requested to announce to the members of the Massachusetts Medical Society, that the annual "Communications" were mailed from this office on Saturday last.

**ERRATUM**—Page 473, 14th line from top, for "the umbilical vein opened," read *the umbilical vein entered*.

**COMMUNICATIONS RECEIVED**—Case of Retention of Urine from Stricture.

**BOOKS RECEIVED.**—An Important Thesis on the Disorder known as Bronzed Skin, or Disease of the Supra-Renal Capsules. By E. B. Dalton, M.D. (From the Author.)—Application of the Button Suture to the treatment of Varicose Veins. By N. Boz-man, M.D., New Orleans—Anniversary Oration before the South Carolina Medical Association. By J. D. Bruns, M.D., Charleston, S. C.

**Deaths in Boston** for the week ending Saturday noon, July 14th, 73. Males, 42—Females, 31.—Abortion, 1—Inflammation of the bowels, 1—congestion of the brain, 1—cancer, 2—cholera infantum, 6—cholera morbus, 1—consumption, 11—convulsions, 2—dropsy, 3—dropsy in the head, 3—lycintery, 2—epilepsy, 1—fracture of the skull, 1—scarlet fever, 4—disease of the heart, 2—Intemperance, 2—disease of the liver, 2—disease of the lungs, 1—Inflammation of the lungs, 2—marasmus, 1—measles, 3—necrosis (cerebral), 1—old age, 1—palsy, 1—peritonitis, 1—premature birth, 4—scrofula, 1—scirrhous (of uterus), 1—disease of the stomach, 1—smallpox, 1—suicide, 1—suffocation, 1—tabes mesenterica, 2—trismus nascentium, 1—unknown, 4.

Under 5 years, 36—between 5 and 20 years, 3—between 20 and 40 years, 19—between 40 and 60 years, 10—above 60 years, 5. Born in the United States, 63—Ireland, 18—other places, 2.